

What is claimed is:

[Claim 1] 1. A projection device having single light valve, suitable for projecting an image to a screen, the projection device comprising:

a light source, for providing a light beam;

a projection lens, disposed behind the light source, and located on a propagation path of the light beam;

an image unit, disposed between the light source and the projection lens, and located on the propagation path of the light beam, wherein the image unit comprises a color production device and a light valve disposed behind the color production device, and located on the propagation path of the light beam; and

a beam breaker module, disposed between the light source and the screen, and the beam breaker module selectively cutting in or cutting out from the propagation path of the light beam, wherein when the beam breaker module is on the propagation path of the light beam, the beam breaker module block the passing light beam within a specific time period according to a state of the color production device.

[Claim 2] 2. The projection device of claim 1, wherein the beam breaker module comprises:

an optical sensor, disposed beside the color production device, so as to sense the state of the color production device;

a beam breaking part, disposed between the light source and the screen; and

an actuator, coupled with the beam breaking part, so as to control the beam breaking part to cut in or cut out from the propagation path of the light beam.

[Claim 3] 3. The projection device of claim 2, wherein the beam breaking part is disposed between the light source and the image unit.

[Claim 4] 4. The projection device of claim 2, wherein the beam breaking part is disposed in the image unit.

[Claim 5] 5. The projection device of claim 2, wherein the beam breaking part is disposed between the image unit and the projection lens.

[Claim 6] 6. The projection device of claim 2, wherein the beam breaking part is disposed in the projection lens.

[Claim 7] 7. The projection device of claim 2, wherein the beam breaking part is disposed between the projection lens and the screen.

[Claim 8] 8. The projection device of claim 1, further comprising a control unit, to synchronously control the color production device, the light valve, and the beam breaker module.

[Claim 9] 9. The projection device of claim 2, further comprising a control unit, wherein the control unit comprises:

a light valve driver, electrically coupled with the light valve;
an actuator driver, electrically coupled with the actuator to control the beam breaking part; and

a color production device driver, electrically coupled with the color production device,

wherein the light valve driver, the actuator driver, and the color production device driver are used to synchronously control the light valve, the beam breaker module, and the color production device.

[Claim 10] 10. The projection device of claim 1, wherein the color production device comprises a color wheel.

[Claim 11] 11. The projection device of claim 10, wherein the color wheel has a red filtering region, a green filtering region, and a blue filtering region.

[Claim 12] 12. The projection device of claim 10, wherein the color wheel has a red filtering region, a green filtering region, a blue filtering region, and a white filtering region.

[Claim 13] 13. The projection device of claim 1, wherein the color production device comprises a color drum.

[Claim 14] 14. The projection device of claim 13, wherein the color drum has a red filtering region, a green filtering region, and a blue filtering region.

[Claim 15] 15. The projection device of claim 13, wherein the color wheel has a red filtering region, a green filtering region, a blue filtering region, and a white filtering region.

[Claim 16] 16. A projection device having single light valve, having a first operation mode and a second operation mode, suitable for projecting an image to a screen, the projection device comprising:

a light source, for providing a light beam;
a projection lens, disposed behind the light source, and located on a propagation path of the light beam;

an image unit, disposed between the light source and the projection lens, and located on the propagation path of the light beam, wherein the image unit comprises a color production device and a light valve disposed behind the color production device, and located on the propagation path of the light beam; and

a beam breaker module, disposed between the light source and the screen, wherein when the projection device is at the first operation mode, the beam breaker module cuts in the propagation path of the light beam to break the passing light beam within a specific time period, and when the projection device is at the second operation mode, the beam breaker module cuts out from the propagation path of the light beam.

[Claim 17] 17. The projection device of claim 16, wherein the beam breaker module comprises:

an optical sensor, disposed beside the color production device, so as to sense the state of the color production device;

a beam breaking part, disposed between the light source and the screen; and

an actuator, coupled with the beam breaking part, so as to control the beam breaking part to cut in or cut out from the propagation path of the light beam.

[Claim 18] 18. The projection device of claim 16, wherein the first operation mode is a high color saturation mode and the second operation mode is a high brightness mode.